

Appl. No. 09/183,380
Amdt. dated April 14, 2005
Reply to Official Action dated March 7, 2005

REMARKS/ARGUMENTS

Claims 1- 37 remain pending in the application.

Applicants earnestly request that the Examiner reconsider his decision rejecting the claims.

The §102 Rejection

Claims 1-6, 8-11, 14-24, and 37 are rejected under 35 U.S.C. §102(a) as being anticipated by *Hu et al.* (U.S. Patent 6,227,947 B1).

Applicants respectfully traverse the rejections of Claims 1-6, 8-11, 14-24, and 37 under 35 USC §102(a), and request that these rejections be withdrawn.

As mentioned in the previous response, *Hu, et al.*, discloses methods and apparatus for cleaning a polishing pad used for chemical-mechanical polishing of a metal layer on a wafer that include the use of at least two dispensers for dispensing cleaning liquids. However, *Hu, et al.*, are silent with respect to Applicants' claimed limitations regarding a first dispenser being disposed downstream of the wafer's location on the polishing pad by a distance d1, and a second dispenser being disposed upstream of the wafer's location on the polishing pad by a distance d2, wherein the upstream and downstream directions are defined in terms of the rotational direction of the polishing pad. There is no disclosure of these recited limitations in *Hu, et al.* Fig. 5 of *Hu, et al.*, does not provide any indication of the claimed spatial relationship between the dispensers and the wafer's location of the polishing pad. In fact, Fig. 5 illustrates the preferred embodiment of *Hu, et al.*, in which the wafer is not in contact with the polishing pad during the period of time in which dispensers 56, 70 are dispensing various liquids.

Applicants respectfully assert that the Examiner in rejecting Applicants' invention has not gained an appreciation of the concepts involved in its operation. The characterization on the part of the Office Action indicating that "since the pad is rotating, any point on the pad except for the very center can be arbitrarily defined as either upstream or downstream of the holder location." The phrase, "since the pad is rotating" is defining a dynamic system in which the direction of rotation has bearing on the

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inventive features. The feature "the second dispensing means location (L2) of the second dispensing means (8) is arranged in an *upstream direction* with respect to the holder location (L0) at a first upstream distance (d3), with the *upstream direction being taken in relation to the first direction (ω_1)*." (Claim 1). Within the invention upon the rotating polishing pad, the passivating agent is dispensed from L2 upstream of the wafer, the passivating agent acts upon the surface of the metal surface of the wafer. After the passivating agent acts upon the wafer, the rotating pad carries away abraded materials from the wafer (abraded materials mixed with the passivating agent). These abraded materials from the wafer are removed by the additional feature of the first dispensing means location (L1) of the first dispensing means (7) is arranged in a *downstream direction* with respect to the holder location (L0) at a first downstream distance (d1), with the downstream direction being taken in relation to the first direction (ω_1)." An etching agent is dispensed from L1 downstream of the wafer. The etching agent dissolves the abraded materials originating from the wafer that are present on the polishing pad. The etching agent prepares the polishing pad for another round of CMP at each rotation.

The material removal rate of the CMP process according Applicants' invention "will be more constant than in the prior art (Specification, page 4, lines 25-27)." If the locations of the nozzles L2 and L1 were reversed, the sequence of CMP steps implemented by Applicants' invention is reversed and the invention is rendered inoperable. Therefore, the Office Action's assertion, "any point on the pad except for the very center can be arbitrarily defined as either upstream or downstream of the holder location," is incorrect. Consequently, *Hu et al.* does not anticipate Applicants' invention.

Per MPEP §2131:

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently describe in a single prior art reference." *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628,631,2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as contained in the . . . claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim.

In view of the foregoing, Applicants respectfully re-assert that the rejections under 35 USC 102(a) of independent Claims 1 and 19, and the claims which depend therefrom, are improper and should be withdrawn.

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The §103 Rejection

Claims 7, 12-13, 25, and 30-31 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Hu et al.*

Claims 16 and 34 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Hu et al.* in view of Sandhu et al. (U.S. Patent 6,120,347).

Applicants respectfully traverse the rejections of Claims 7, 12-13, 25 and 30-31 under 35 USC §103(a), and request that these rejections be withdrawn.

As discussed above in connection with the rejections under 35 USC §102, *Hu, et al.*, is silent with respect to Applicants' claimed limitations regarding a first dispenser being disposed downstream of the wafer's location on the polishing pad by a distance d1, and a second dispenser being disposed upstream of the wafer's location on the polishing pad by a distance d2, wherein the upstream and downstream directions are defined in terms of the rotational direction of the polishing pad. Since *Hu, et al.*, does not disclose, suggest or provide motivation for the recited limitations of the independent Claims, Applicants respectfully submit that the Examiner's assertions regarding the obviousness of polishing tungsten, using hydrogen peroxide as an oxidizing agent, or phthalic acid as a passivating agent, as recited in the dependent Claims, do not provide the appropriate basis for rejection under 35 USC §103(a).

In view of the foregoing, Applicants respectfully assert that the rejections under 35 USC 103(a) of Claims 7, 12-13, 25 and 30-31, are improper and should be withdrawn.

With respect to Claims 16 and 34, Applicants respectfully traverse these rejections for the reasons substantially as set forth above in connection with Claims 7, 12-13, 25 and 30-31. Applicants respectfully assert that since the placement of nozzles L1

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and L2 with respect to the rotational direction of the wafer determines whether the sequence of steps of Applicants' invention is followed, *Sandhu et al* teaches away from Applicants' invention in "that the wafer carrier may be rotated in either direction during polishing." Furthermore, modifying Applicants' invention according to Sandhu et al. *Sandhu et al.* alone or in combination with *Hu et al.* does not render obvious Applicants' invention.

Although *Sandhu, et al.*, discloses rotating the wafer either clockwise or counterclockwise, Applicants' recited limitations in independent Claims 1 and 19, from which Claims 16 and 34 respectively depend, are not disclosed, suggested, or motivated, by the cited references either singularly or in combination.

References are not properly combinable or modifiable if their intended function is destroyed. Modifying Applicants' invention through *Sandhu et al* and *Hu et al* renders it inoperable. The CCPA and the Federal Circuit have held that when a §103 rejection is based upon a modification of a reference that destroys the intent, purpose or function of the invention disclosed in the reference, such a proposed modification is not proper and the *prima facie* case of obviousness can not be properly made. See *in re Gordon*, 733 F. 2d 900, 221 USPQ 1125 (Fed. Cir 1984). Furthermore, to assert a proper §103 rejection, there must be a basis in the art for combining or modifying references, MPEP §2143.01 provides:

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990)

In view of the foregoing, Applicants respectfully re-assert that the rejections under 35 USC 103(a) of Claims 16 and 34, are improper and should be withdrawn.

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Conclusion

Applicants believe they have addressed the Examiner's concerns. The claims as presented are allowable over the cited references.

Applicants request that a timely Notice of Allowance be issued in this case.

Please charge any fees other than the issue fee and credit any overpayments to Deposit Account 14-1270.

Respectfully submitted,

Date: 14-APR-2005

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